CS1026 – Assignment #1
Good Morning, Canada!

Due: Monday, May 17, 11:55pm on OWL
Weight: 9%

Learning Outcomes

By completing this assignment, you will gain skills relating to:

- basic Python programming constructs;
- expressions and decisions;
- getting input from users;
- validating input;
- algorithm development and testing;
- designing test cases; and
- following program specifications.

Task

Your task is to write a complete program in Python that computes the cost of breakfast at the Good Morning, Canada! restaurant. Your program will prompt the user for input and validate that input before computing the results. Your program will make use of expressions, decisions and input/output in Python. You should name your program `Assign1.py`.

Functional Requirements/Specifications

1. The program will prompt the user for various pieces of information about their desired breakfast. The required information is described below. Some of the information is dependent on the type of breakfast being ordered. Once all of the information has been entered, the program will compute and display the amount of money (including tax) charged for the customer's breakfast.

2. The customer can build a custom breakfast from the following individual food and beverage items:

Item	Price (dollars)
Eggs	0.99 (each)
Pancakes	1.49 (each)
French toast	1.39 (per slice)
Bacon	0.59 (per strip)
Sausage	1.39 (each link)
Home fries	1.99 (per side)
Toast	0.79 (per slice)
Coffee	1.49 (per cup)
Tea	1.29 (per bag)
Orange Juice	1.99 (per cup)

3. A customer may choose to order a combo. **If the customer chooses a combo, your program will subtract 10% off of the total price of the combo before tax**. The combos are as follows:

Combo	Items Included
Egg combo	Three eggs; one side of home fries; two slices of toast; four strips of bacon; two sausage links
Pancake combo	Three pancakes; four strips of bacon; three sausage links
French toast combo	Four pieces of French toast; one side of home fries; four strips of bacon; two sausage links

4. The program will display the available choices in the following way:

```
Welcome to Good Morning, Canada! Can I take your order?

Enter item (q to terminate): egg combo, pancake combo, French toast combo, eggs, pancakes, French toast, bacon,
 sausage, home fries, toast, coffee, tea, orange juice:
```

The user will type the customer's choice. For instance, if the customer wants a pancake combo, the user will type, `pancake combo <enter>`. The program will

then ask for the quantity: `How many pancake combos would you like?` The program continues to ask for additional menu items by re-displaying the choices. When the customer is done ordering, the user enters `q <enter>`. The program then displays the pre-tax total (i.e., subtotal), the tax, and the total with tax. The customer can order anything that they want from the menu in any quantity that they want. **(See the examples on pages 6 and 7 if any of this is unclear.)**

5. The program will compute the total cost of the order with additional taxes of 13%. All of the costs are to be rounded to the nearest penny and displayed with a dollar sign and two decimal positions. For example, a total cost of `13.66666` will be displayed as `13.67`. **All numeric output should have two (2) decimal places (e.g., 1.01, 0.00, etc.).**

6. The program will compute the prices for the combos based on the prices of the items that they include, and it will apply a 10% discount before tax. You are **NOT ALLOWED** to pre-compute the costs of these combos and then hard code these literal numbers in the program.

7. The program must be able to compute the total breakfast cost for an entire table of customers. For example, three customers may be sitting at the same table, where **customer A** orders the pancake combo with coffee; **customer B** orders two eggs, three pieces of toast, two strips of bacon, one sausage link and a cup of tea; and **customer C** orders a French toast combo, two extra strips of bacon and a coffee. **The user would enter the quantities for all of these menu items:** 1 pancake combo, 2 coffees, 2 eggs, 3 pieces of toast, 4 strips of bacon, 1 sausage link, 1 tea, 1 French toast combo.

8. The program must request user input **in the same order as done in the examples on pages 6 and 7. This is to say, the program will ask for the menu item and then for its quantity, not the other way around.**

9. Your program must accept inputs whether they contain uppercase or lowercase characters (e.g., `BiG breakfast`, `big breakfast` and `BIG BREAkfast` should all be accepted). Additionally, your program must be robust to leading and trailing spaces (i.e., the user enters spaces incorrectly before or after the input), including cases when multiple spaces separate words in input lines (e.g., `small breakfast` and `small  breakfast` should both be accepted). A python function that performs this type of input formatting is provided to you:

```
def format_input(text_line):
    text_line = text_line.lower().strip()
    word_list = text_line.split()
    text_line = " ".join(word_list)
    return text_line
```

10. Your program must also detect and report invalid input; that is, the input must match one of the keywords or phrases exactly (ignoring case and spaces). **When an invalid input is detected, the program will display an error message and prompt for the input until the user enters a correct input.**

11. Your program must be robust to users entering input other than numbers when quantities are requested. **That is, you should input the string and validate that the input is numeric.** This can done using `isnumeric()`. So, to test whether the value of a variable quantity is actually a number, you can do `quantity.isnumeric()`. This will return `True` if it is a number and `False` otherwise.

12. Finally, a number of test cases will be run against your program. Some examples of output and test cases can be seen in the examples on pages 6 and 7; **these are NOT comprehensive – you should create your own test cases and thoroughly test your program**.

Non-Functional Requirements/Specifications

1. Include brief **comments** in your code identifying yourself (i.e., include your name in a comment at the beginning of your program), describing the program, and describing key portions of the code.

2. Assignments are to be done individually and **must be your own work**. Software may be used to detect academic dishonesty (cheating).

3. Use Python coding conventions and good programming techniques. Examples include:

    - meaningful variable names;
    - conventions for naming variables and constants (you can use underscores or camel case, but be consistent);

- use of constants, where appropriate;
- readability; and
- indentation.

4. The name of the file you submit **MUST** be `Assign1.py`. You will attach the `Assign1.py` file in OWL. **DO NOT** compress/zip it. **DO NOT** just enter code into the text submission area on OWL.

5. Make sure to use **Python 3.9** as the interpreter; failure to do so may result in the testing program failing.

Marking the Assignment

The TAs will be looking at the following things when grading your assignment:

1. Does the program behave according to the specifications found in the assignment document?

2. Does the program handle both valid and invalid input properly?

3. Is the output according to specifications (e.g., does it show a subtotal, the tax and the final amount)? Is the calculated output correct?

4. Does the program follow the instructions for both input and output?

5. Does the submission meet the non-functional requirements (e.g., proper naming conventions, readability, proper file name, comments, etc.)?

The TAs will also be checking to ensure that things were not hardcoded and that your program actually uses the techniques learned in this course.

Examples

A Basic Order

```
Welcome to Good Morning, Canada! Can I take your order?

Enter item (q to terminate): egg combo, pancake combo, French toast combo, eggs, pancakes, French toast, bacon,
 sausage, home fries, toast, coffee, tea, orange juice: egg combo
You ordered:  egg combo
How many egg combos would you like? 1

Enter item (q to terminate): egg combo, pancake combo, French toast combo, eggs, pancakes, French toast, bacon,
 sausage, home fries, toast, coffee, tea, orange juice: q

Subtotal:      10.51
Tax:            1.37
Total:         11.88
```

A Custom Breakfast

```
Welcome to Good Morning, Canada! Can I take your order?

Enter item (q to terminate): egg combo, pancake combo, French toast combo, eggs, pancakes, French toast, bacon,
 sausage, home fries, toast, coffee, tea, orange juice: eggs
You ordered:  eggs
How many eggs would you like? 2

Enter item (q to terminate): egg combo, pancake combo, French toast combo, eggs, pancakes, French toast, bacon,
 sausage, home fries, toast, coffee, tea, orange juice: bacon
You ordered:  bacon
How many pieces of bacon would you like? 3

Enter item (q to terminate): egg combo, pancake combo, French toast combo, eggs, pancakes, French toast, bacon,
 sausage, home fries, toast, coffee, tea, orange juice: home fries
You ordered:  home fries
How many orders of home fries would you like? 2

Enter item (q to terminate): egg combo, pancake combo, French toast combo, eggs, pancakes, French toast, bacon,
 sausage, home fries, toast, coffee, tea, orange juice: toast
You ordered:  toast
How many pieces of toast would you like? 2

Enter item (q to terminate): egg combo, pancake combo, French toast combo, eggs, pancakes, French toast, bacon,
 sausage, home fries, toast, coffee, tea, orange juice: coffee
You ordered:  coffee
How many cups of coffee would you like? 1

Enter item (q to terminate): egg combo, pancake combo, French toast combo, eggs, pancakes, French toast, bacon,
 sausage, home fries, toast, coffee, tea, orange juice: q

Subtotal:      10.80
Tax:            1.40
Total:         12.20
```

An Order Error

```
Welcome to Good Morning, Canada! Can I take your order?

Enter item (q to terminate): egg combo, pancake combo, French toast combo, eggs, pancakes, French toast, bacon,
 sausage, home fries, toast, coffee, tea, orange juice: pancake
You ordered:  pancake
Sorry, but we don't serve that item.
Please make sure you spelled your order correctly.

Enter item (q to terminate): egg combo, pancake combo, French toast combo, eggs, pancakes, French toast, bacon,
 sausage, home fries, toast, coffee, tea, orange juice: pancakes
You ordered:  pancakes
How many pancakes would you like? 3

Enter item (q to terminate): egg combo, pancake combo, French toast combo, eggs, pancakes, French toast, bacon,
 sausage, home fries, toast, coffee, tea, orange juice: q

Subtotal:       4.47
Tax:            0.58
Total:          5.05
```

A Quantity Error

```
Welcome to Good Morning, Canada! Can I take your order?

Enter item (q to terminate): egg combo, pancake combo, French toast combo, eggs, pancakes, French toast, bacon,
 sausage, home fries, toast, coffee, tea, orange juice: French toast combo
You ordered:  french toast combo
How many french toast combos would you like? three
Please enter a valid integer.
How many french toast combos would you like? 3.0
Please enter a valid integer.
How many french toast combos would you like? 3

Enter item (q to terminate): egg combo, pancake combo, French toast combo, eggs, pancakes, French toast, bacon,
 sausage, home fries, toast, coffee, tea, orange juice: q

Subtotal:      34.26
Tax:            4.45
Total:         38.71
```